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EXAMINER	
FIDLER, SHELBY LEE	
ART UNIT	**PAPER NUMBER**
2861	

DATE MAILED: 09/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/730,179	SU ET AL.	
	Examiner	Art Unit	
	Shelby Fidler	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-9,12-17* is/are rejected.

7)☒ Claim(s) *2,3,10 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 5, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims state that the invention comprises a plurality of electrodes, "each of which is disposed in each channel of the inkjet cartridge." This is confusing, since the claim states that each electrode is disposed in each channel; however, Figure 4 of the applicant's disclosure appears to show only one electrode per channel. For the purpose of rejection, Examiner assumes that there is one electrode per channel.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5, 8, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6679582 B2) in view of Setoyama (JP 10227466 A).

Regarding claim 1:

Silverbrook teaches a leakage detection apparatus for a multi-channel inkjet cartridge comprising:

a plurality of electrodes (*detection electrodes*), a plurality of channels (*inlet channels 48, Fig. 5a*); and a controller (*nozzle fault circuit*) coupled to the electrodes (*Fig. 5b*), to detect leakage between channels (*col. 5: 18-22 shows that ink builds-up in the containment formations 146, which are between the channels 48*).

Silverbrook does not expressly teach that one of the plurality of electrodes is disposed in each of the channels, respectively, the electrodes contacting the reagent in the corresponding channel. At the time of invention, it would have been obvious to a person of ordinary skill in the art to insert one of the plurality of electrodes into one of the channels of the inkjet cartridge respectively, since it has been held that rearranging parts of an invention involves only routine skill in the art. ***In re Japikse*, 86 USPQ 70.**

However, Setoyama teaches that one of the plurality of electrodes (*electrode 4*) is disposed in each of the channels (*piping unit 1*), respectively (*Fig. 1*), the electrodes contacting the reagent (*W*) in the corresponding channel (*Fig. 1*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify Silverbrook's electrode positioning to incorporate one electrode in each of the channels. The motivation for doing so, as taught by Setoyama, is so that the electrode can be immersed into the electro-conductive liquid, allowing for accurate detection of the presence of leakage (*abstract*) since it is well known that an immersed electrode provides greater reliability than an electrode that has not been immersed.

Regarding claim 5:

Silverbrook teaches an inkjet dispensing apparatus comprising:

a cartridge including a plurality of channels (*ink inlet channels 48, Fig. 5a*), wherein reagents are received in the channels (*col. 3, lines 57-58*);

a chip disposed on the cartridge (*substrate 16, Fig. 5a*), including a plurality of first through holes (*apertures 84, Fig. 5a*) communicating with one of the channels respectively (*aperture 84 communicates with respective channel 48, Fig. 5a*);

a plurality of electrodes (*col. 5, lines 20-22*); and

a controller (*nozzle fault circuit, Fig. 5a*), coupled to the electrodes (*Fig. 5b*), to detect leakage between channels (*col. 5, lines 18-22 shows that ink builds-up in the containment formations 146, which are between the channels 48*).

Silverbrook does not expressly teach that one of the plurality of electrodes is disposed in each of the channels, respectively, the electrodes contacting the reagent in the corresponding channel. At the time of invention, it would have been obvious to a person of ordinary skill in the art to insert one of the plurality of electrodes into one of the channels of the inkjet cartridge respectively, since it has been held that rearranging parts of an invention involves only routine skill in the art. ***In re Japikse*, 86 USPQ 70.**

However, Setoyama teaches that one of the plurality of electrodes (*electrode 4*) is disposed in each of the channels (*piping unit 1*), respectively (*Fig. 1*), the electrodes contacting the reagent (*W*) in the corresponding channel (*Fig. 1*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify Silverbrook's electrode positioning to incorporate one electrode in each of the channels. The motivation for doing so, as taught by Setoyama, is so that the electrode can be immersed into the electro-conductive liquid, allowing for accurate detection of the presence of

leakage (*abstract*) since it is well known that an immersed electrode provides greater reliability than an electrode that has not been immersed.

Regarding claim 8:

Silverbrook teaches the additional limitation of a barrier layer (*dielectric layer 18, Fig. 1*), disposed on the chip (*layer 18 is disposed on substrate 16, Fig. 1*), including a plurality of second through holes communicating with the first through holes respectively (*Fig. 5a*); and

a nozzle plate disposed on the barrier layer (*nozzle guard 80 disposed on top of layer 18, Fig. 5a*), including a plurality of orifices communicating with the second through holes respectively (*apertures 84, Fig. 5a*).

Regarding claim 13:

Silverbrook teaches a leakage detection method comprising:

providing an inkjet cartridge (*not shown*), a plurality of electrodes (*detection electrodes, col. 5, lines 18-22*), and a controller (*nozzle fault circuit, Fig. 5a*), wherein the inkjet cartridge includes a chip (*substrate 16, Fig. 5a*) and a plurality of channels (*ink inlet channels 48, Fig. 5a*), reagents are received in the channels (*col. 3, lines 57-58*), and the electrodes are coupled to the controller (*Fig. 5b*);

the controller detecting the leakage between the channels via the electrodes (*col. 5, lines 18-22 shows that ink builds-up in the containment formations 146, which are between the channels 48*).

Silverbrook does not expressly teach the step of inserting the electrodes to one of the channels of the inkjet cartridge respectively so that each of the electrodes contacts the reagent in the corresponding channel. At the time of invention, it would have been obvious to a person of ordinary skill in the art to insert one of the plurality of electrodes into one of the channels of the

inkjet cartridge respectively, since it has been held that rearranging parts of an invention involves only routine skill in the art. ***In re Japikse*, 86 USPQ 70.**

However, Setoyama teaches the step of inserting the electrodes (*electrodes 4*) to one of the channels (*piping units 1*) respectively (*Fig. 1*) so that each of the electrodes contacts the reagent in the corresponding channel (*electrodes 4 contact the liquid within the piping 1, Fig. 1*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify Silverbrook's electrode positioning to incorporate one electrode in each of the channels. The motivation for doing so, as taught by Setoyama, is so that the electrode can be immersed into the electro-conductive liquid, allowing for accurate detection of the presence of leakage (*abstract*) since it is well known that an immersed electrode provides greater reliability than an electrode that has not been immersed.

Regarding claim 16:

Silverbrook teaches the additional limitation that the controller provides voltage to one of the electrodes after inserting the electrodes into the containment formation (*Fig. 5b shows that the controller provides a voltage V+ to the electrodes; this is also shown in col. 5, lines 18-22 in that the electrodes form a circuit*).

Silverbrook does not expressly teach that the electrodes are inserted into the channels.

However, Setoyama teaches that the electrodes (*electrodes 4*) are inserted into the channels (*piping units 1, Fig. 1*).

Claims 4, 12, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6679582 B2) in view of Setoyama (JP 10227466 A), as applied to claims 1, 5, and 13 above, and further in view of Monclus et al. (US 6402277 B1).

Regarding claims 4, 12, and 17:

Silverbrook as modified by Setoyama teach all claimed limitations except that the controller includes a display to display leakage detection results.

However, Monclus et al. teach that the controller includes a display (*front panel*) to display leakage detection results (*col. 6, lines 58-60*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify Silverbrook's controller to include a display. The motivation for doing so, as taught by Monclus et al., is to warn the user to replace the tubes as soon as they break, reducing the risk of damaging the printer (*col. 2, lines 47-50*).

Claims 6, 7, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6679582 B2) in view of Setoyama (JP 10227466 A), as applied to claims 5 and 13 above, and further in view of Kanayama et al. (US 5572241).

Regarding claims 6 and 14:

Silverbrook as modified by Setoyama teach all claimed limitations except that the chip is made of glass.

However, Kanayama et al. teach that the chip (*nozzle unit*) is made of glass (*col. 2, lines 35-38*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize a glass chip into the invention of Silverbrook as modified by Setoyama. The motivation for doing so, as taught by Kanayama et al., is so the chip will not be electrically conductive (*col. 2, lines 35-38*) allowing the resistance between ink detection electrodes to remain high in the absence of ink (*col. 3, lines 20-29 and Fig. 2*).

Regarding claims 7 and 15:

Silverbrook as modified by Setoyama teach all claimed limitations except that an electric-isolating layer covers the chip.

However, Kanayama et al. teach that the chip is covered layer (*e.g. ink pass plate 10, Fig. 1*) is an electric-isolating layer (*col. 2, lines 35-38*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to cover the chip of Silverbrook as modified by Setoyama with an electric-isolating layer. The motivation for doing so, as taught by Kanayama et al., is to allow the resistance between ink detection electrodes to remain high in the absence of ink (*col. 3, lines 20-29 and Fig. 2 and col. 2, lines 35-38*).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6679582 B2) in view of Setoyama (JP 10227466 A), as applied to claim 8 above, and further in view of Harvey (US 5855713).

Regarding claim 9:

Silverbrook as modified by Setoyama teach all claimed limitations except that the nozzle plate is made of polyimide.

However, Harvey teaches that the nozzle plate is made of polyimide (*col. 3, lines 41-48*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize a polyimide nozzle plate into the invention of Silverbrook as modified by Setoyama. The motivation for doing so, as taught by Harvey, is that polyimide is chemically resistant abatable polymer, allowing ablation of the nozzle plate to leave a smooth surface (*col. 4, lines 30-42*).

Allowable Subject Matter

Claims 2, 3, 10, and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 7/4/2006 have been fully considered but they are not persuasive. In response to applicant's argument that Silverbrook does not detect leakage ink between channels, Silverbrook discloses in column 5, lines 18-22 that detection electrodes positioned in the containment formation 146 detect the build-up of leaked ink within the containment formation. Since Figure 5a of Silverbrook shows the containment formations 146 to be located between channels 48, Silverbrook discloses detecting leakage ink between channels.

In response to applicant's argument that the motivation for combining Silverbrook and Setoyama is improper, please see the abstract of Setoyama, which teaches inserting an electrode into piping "so as to be immersed into the electroconductive liquid." Also in the abstract, Setoyama teaches that this arrangement will "accurately detect the presence of leakage." It is well known that, in the context of either Silverbrook's or Setoyama's inventions, an immersed electrode has greater reliability that an electrode which is not immersed. Examiner would also like to point out that Silverbrook's invention comprises at least two detection electrodes in each containment formation, as disclosed in column 5, lines 20-22, so that leaked ink completes a circuit between the detection electrodes. Therefore, moving one of Silverbrook's electrodes into

the channel 48 (as taught by Setoyama) produces the same functionality of detecting the build-up of leakage ink in the containment formations 146, making the position of the electrodes a matter of design choice. Additionally, inserting one of Silverbrook's electrodes into the channel is a simple rearrangement of parts, which has been held to involve only routine skill in the art. *In re Japikse, 86 USPQ 70.*

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelby Fidler whose telephone number is (571) 272-8455. The examiner can normally be reached on MWF 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vip Patel can be reached on (571) 272-2458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SF 9/1/06

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